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|                                                                                                                                                                                                                                                                                 |                                                                                                                                                                                                                                                                                                                                                                   |
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| <div>(71) Applicant: Steamery AB<br/>118 48 Stockholm (SE)</div>                                                                                                                                                                                                                |                                                                                                                                                                                                                                                                                                                                                                   |

(54)

HANDHELD STEAMER IRON

(57) A handheld steamer (1) for vertical or horizontal steaming is provided. The steamer comprises a heated ironing plate (2) providing an ironing surface being adapted to be in contact with a fabric to be treated. The ironing plate is of at least 13.0 cm width and is provided with one or more steam outlets (4). Further, an integrated water tank (3) is comprised. The steamer comprises a hand grip (6) for a user and a boiler (8) for heating water in the water tank to produce steam, and the boiler comprises one or more flow paths (5) for providing the produced steam to the one or more steam outlets. The ironing plate is heated by that the one or more flow paths are arranged to provide heat to the ironing plate.

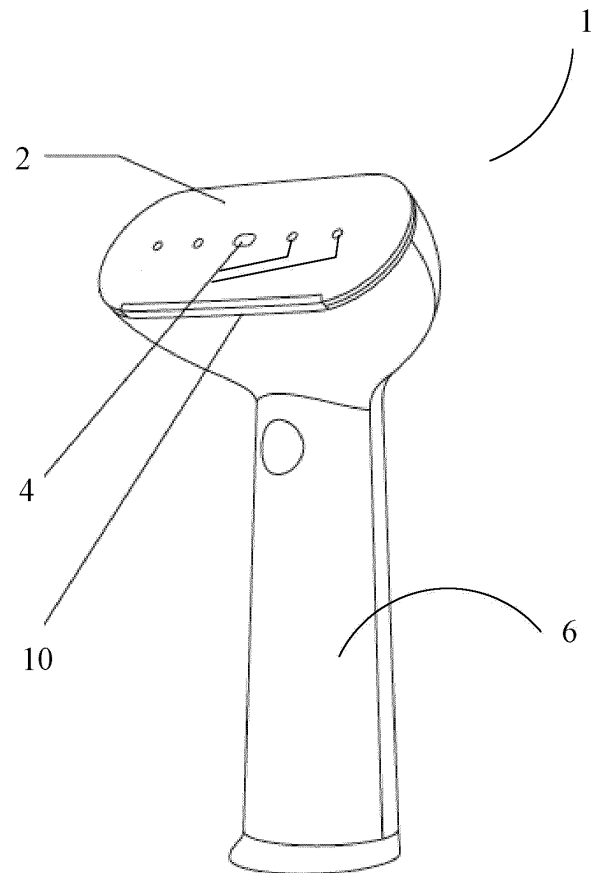


Fig. 1

## Description

### TECHNICAL FIELD

**[0001]** A handheld steamer for vertical or horizontal steaming is provided. The steamer comprises an ironing plate providing an ironing surface adapted to be in contact with a fabric to be treated and provided with one or more steam outlets. The steamer comprises an integrated water tank, a boiler for heating water in the water tank into steam and one or more flow paths for providing the steam to the steam outlets.

### BACKGROUND

**[0002]** Traditional ironing and steam pressing using an iron/steam press in combination with an ironing/press board is a time consuming and bulky process for some customers.

**[0003]** Some clothing design (eg. pleats, folds, sewing creating volume, twisting and similar) does not allow the ironing / pressing technique as they cannot lie flat on a flat surface (ironing board) and can therefore not be ironed/pressed. Still further, traditional ironing equipment is not always available.

**[0004]** Vertical ironing is a modern way of ironing fabrics, providing an easy and efficient way of treating fabrics in a simplified way. However, vertical ironing /steaming, using only steam to smooth out wrinkles does only to some extent solve the above stated problem. This technique is sometimes criticized as it may be hard to smooth out stubborn wrinkles and creases. Another problem with steaming is also that powerful vertical steamers, often standing on the floor, takes up much space.

**[0005]** Yet another problem is that steamers often suffer from problem with calcified deposits, clogging the flow paths of the steam. Over time, minerals in the water may accumulate in the steam paths to form calcified deposits, also known as 'scale' or 'calc'. These calcified deposits may also become dislodged and vented through the ironing plate onto the garment being treated by the steamer.

**[0006]** Known arrangements for solving this problem is often large and bulky and is therefore difficult to apply to a small, handheld vertical steamer.

**[0007]** An object of embodiments provided herein is to provide an improved steamer, at least minimizing some of the problems mentioned above.

### SUMMARY

**[0008]** In embodiments herein, a handheld steamer for vertical or horizontal steaming is provided. The steamer comprises a heated ironing plate providing an ironing surface being adapted to be in contact with a fabric to be treated. The ironing plate is in embodiments herein of at least 13.0 cm width and is provided with one or more steam outlets. Further, an integrated water tank is comprised. The steamer comprises a hand grip for a user

and a boiler for heating water in the water tank to produce steam, the boiler comprises one or more flow paths for providing the produced steam to the one or more steam outlets. The ironing plate is heated by that the one or more flow paths are arranged to provide heat to the ironing plate. The width of the ironing plate together with further advantageous features provided either alone or in any combination provides for an improved handheld steamer.

**[0009]** In embodiments herein, the one or more flow paths may further comprise one or more lime scale traps. In still other embodiments herein, the steamer may further comprise two flow paths for the steam. In alternative embodiments, the steamer may comprise more than two flow paths. In yet other embodiments herein, each of said flow paths may comprise one or more lime scale traps. In embodiments herein, the one or more lime scale traps may be integrated in the respective one or more flow paths.

**[0010]** In embodiments herein, the ironing plate may comprise a plurality of steam outlets. In embodiments herein, the ironing plate may be provided with a rough surface, providing friction between the ironing plate and the fabric to be treated. In embodiments herein, the profile of the ironing plate may be convex. These features, preset in a steamer one by one or in combination, serve for a more efficient performance of the presented steamer.

**[0011]** In embodiments herein, the steamer may further comprise a sheet of heat resistant material between the heated parts and the non-heated parts of the steamer, and a part of the sheet may protrude beyond the surface of the ironing plate, thereby providing a heat resistant rest position edge when the steamer is placed in a substantially horizontal rest position.

**[0012]** In embodiments herein, the integrated water tank may be releasably attached to the steamer by use of one or more magnets. In embodiments herein, the steamer may further comprise a steam eject button.

**[0013]** In other alternative embodiments herein, the steamer may be provided with safety functions. The steamer may in some embodiments be provided with an auto-shut-off function whereby the steamer is shut off after a predetermined time period. In other embodiments herein, the steamer may further comprise one or more sensors connected to the hand grip, thereby indicating the presence of a user. The steamer may thus be automatically shut off after a predetermined time period if no presence of a user is indicated. In still other embodiments herein, the steamer may further comprise one or more sensors sensing movements of the steamer thereby indicating the presence of a user, wherein the steamer is automatically shut off after a predetermined time period if no presence of a user is indicated. It is to be noted that the disclosed safety functions may be present in a steamer one by one or in any combination.

## BRIEF DESCRIPTION OF DRAWINGS

**[0014]**

Fig. 1 shows a steamer disclosed in embodiments herein seen from the front.

Fig. 2 shows a steamer disclosed in embodiments herein seen from the back.

Fig. 3 shows a steamer when in use.

Fig. 4, 5 and 6 show details of the steamer, including flow paths of the steam and details of an integrated lime scale trap.

Fig. 7 is a schematic detailed view of showing the principal of a lime scale trap in embodiments herein.

Fig. 8 and 9 shows details of an edge for use in a substantially horizontal rest position.

Fig. 10 shows the ironing plate being provided with a convex profile for optimized steaming.

Fig. 11, 12, 13, 14 shows a steamer with an integrated water tank provided with a magnet holder.

Fig. 15 shows details of a boiler with a lime scale trap.

## DETAILED DESCRIPTION

**[0015]** Fig. 1 shows a handheld steamer 1 according to embodiments disclosed herein. The steamer 1 is provided with an ironing plate 2 adapted to form an ironing surface adapted to be in contact with a fabric to be treated. The ironing plate 2 is provided with one or more steam outlets 4. In the shown embodiment, an elongated steam outlet 4 is placed in the middle of the ironing plate 2, with a plurality of smaller outlets 4 on the side. It is to be noted that any other arrangements of one or more steam outlets may be used. The steamer may be used for vertical or horizontal steaming, and the steamer is designed to either be placed in a standing or lie down rest position. The steamer has a hand grip for a user

**[0016]** Fig. 2 shows a steamer according to embodiments herein seen from the back. The steamer is provided with a steam button 14, and an on/off switch 15. In the lower part of the steamer an integrated water tank 3 is present. The steamer may be powered by a cable or by any other means providing power. The steamer is provided with a boiler 8 for heating the water in the water tank in order to produce steam. One or more flow paths 5 is arranged for providing the produced steam to the steam outlets 4. The flow paths 5 may comprise one or more lime scale traps 7.

**[0017]** Fig. 3 shows the steamer when in use. In this example, a user 13 is steaming a garment 18 from the

outside. The garment 18 may for example be placed on a hanger and the steamer 1 is moved over the fabric to spread steam to the garment 18. For safety reasons, the steamer 1 shall be pointed so that the steam jets always direct away from the user 13. To provide a professional result, the shape and the surface structure of the ironing plate 2 optimizes the performance by improving how the steamer follows the fabric. The steamer may as well be used from the inside of a hanging fabric, or in a traditional ironing manner, on a flat laying fabric.

**[0018]** Fig. 4 shows the boiler 8 inside of the ironing plate 2. The exemplified steamer 1 is provided with one water inlet 9 to the boiler 8 for heating the water. In this exemplified embodiment, heating is provided by heating elements placed under the flow paths. The water inlet 9 is divided into two channels forming flow paths 5 for the steam, inside the boiler. By using two channels, the distribution of the heat is more even and efficient. Further, the area used for heating the steam and the ironing plate is maximized and therefore the steam quality is maximized.

**[0019]** Fig. 5 and 6 show details of an example of a boiler 8. Fig. 5 shows the inside of the boiler 8, and fig. 6 shows the outside. Heating elements are integrated in the boiler, preferably below the flow paths 5 of the steam. In the shown embodiment, two channels are providing flow paths for the steam. Water is provided to the boiler 8 by one single water inlet 9, and the water /steam are thereafter divided into the two channels providing the flow paths 5. It is to be noted that a single channel may as well be used, or more than two channels. Each, or alternatively only some, of the flow paths may comprise one or more lime scale traps. The traps may preferably be integrated in the flow path 5 and ensures that deposits of calc and other minerals present in the steam are trapped and prevented from causing trouble in the steamer. The basic principle of the trap will be explained later. The flow path 5 is designed to circulate the steam under the ironing plate in such a way that an even heat is provided to the ironing plate. This is advantageous since an even heat is very important for a perfect result.

**[0020]** In Figs. 7a, 7b and 15, the principle of a lime scale trap is illustrated. In Fig. 7a, a steam path with no lime scale trap is shown. The steam is simply following a straight passage from the inside of a steamer to a steam outlet. Deposits of calc and other minerals will either fall down due to gravity and over time result in that the steam flow path and/or the steam outlets will be clogged, resulting in an un-usable device, or either follow the steam out to deposit on the garments instead.

**[0021]** Fig. 7b shows the principle of a lime scale trap 7 according to embodiments herein. The steam is following a steam flow path 5 with an integrated lime scale trap 7. The principle is that the steam together with calc particles enters the trap 7, but due to gravity particles will fall down and only pure steam will leave the trap 7. Thereby, calcified deposits will be prevented from clogging the flow paths 5 and the steam outlets 4 of the device in which

it is integrated. The lime scale trap 7 is in the shown embodiment integrated in the flow path, thereby providing an efficient solution applicable to small handheld devices. However, other solutions providing a lime scale trap may be used. By using an integrated trap as shown, a simple production is enabled due to the integration of the trap into the pathway of the steam. The lime scale trap 7 protects the device from clogging and the disadvantages relates thereto, resulting in a significant shorter life-time of the steaming device. Yet another advantage is that calcareous water may be used without costly water filters.

**[0022]** Fig. 8 and 9 shows details of an integrated edge for use when the steamer is hot and is to be placed in a substantially horizontal position. In embodiments herein, the steamer comprises a sheet of heat resistant material arranged between the heated parts and the non-heated parts of the steamer. A part of said sheet is protruding beyond the ironing plate surface, thereby providing a heat resistant rest position edge. This is an important feature due to safety reasons since the ironing plate is very hot. A hot ironing surface in contact with sensitive surfaces may be a cause of fire.

**[0023]** Due to the very hot surfaces and the risks related thereto, the steamer may in some embodiments be provided with one or more safety functions. The steamer may be provided with an auto-shut-off function whereby the steamer is shut off after a predetermined time period. As a further safety function, the steamer may as well comprise one or more sensors connected to the hand grip, thereby indicating the presence of a user. The steamer may thus be automatically shut off after a predetermined time period if no presence of a user is indicated. Still further, the steamer may comprise one or more sensors sensing movements of the steamer thereby indicating the presence of a user, wherein the steamer is automatically shut off after a predetermined time period if no presence of a user is indicated. Any of those safety functions enable safe use of the hot device.

**[0024]** Fig. 10 shows the profile of an ironing plate 2 according to embodiments herein. The steamer 1 may be provided with an ironing plate 2 with a profile being convex. The convex profile improves how the steamer follows the garment to be treated, since the profile provides a more efficient contact between the steamer and the garment during a typical movement by a user. Further, the exemplified steamer may have an ironing plate 2 provided with a rough surface, thereby providing friction between the ironing plate 7 and the fabric to be treated. With such a surface with a certain amount of roughness, the garment is prevented from sliding off, or sliding over the steamer to fast. This may be especially advantageous when handling garments of thin and slippery fabrics. By ensuring friction between the ironing plate 2 and the garment 18 to be treated, the garment 18 will slide in a controlled manner when the steamer 1 is used. Further, the garment 18 will stay in contact with the ironing plate 2 during a time period enough to ensure steam to be pro-

vided to the garment 18 in such a manner that harder wrinkles are smoothen out. The rough surface may for example be provided by applying a spray coat to the plate.

**[0025]** Fig. 11, 12, 13, 14 shows a steamer provided with an integrated water tank 3 with a magnet holder. The shown steamer 1 is provided with an integrated water tank 3, releasably attached to the steamer 1 by use of one or more magnets 11. The magnets 11 hold the water tank 3 and when the user 13 is about to fill water into the tank 3, only a minor force need to be applied to overcome the force of the magnets 11. Since no lock or the like is needed, the usage will be simplified. In Fig. 11, the water tank 3 is shown in a release position. In this exemplified embodiment, two magnet are used to hold the water tank in place in the steamer. In Fig. 12, a user 13 releases the water tank 3 from the steamer 1. The water tank 3 may thereafter be filled with water by first lifting a water tank cover 16 as shown in Fig. 13.

**[0026]** This exemplified solution provides for a water tank 3 to be integrated into the steamer 1, and in a simple manner not requiring much force or any tools, releasing the water tank 3 from the steamer 1 when the water tank 3 is to be filled. Thereby, a simple and efficient solution is provided.

**[0027]** Fig. 15 shows one example of boiler 8 with flow paths with an integrated a lime scale trap 7 in accordance with embodiments herein. The steam is following a steam flow path 5 with an integrated lime scale trap 7. The same principle as already described above enables calc particles to enter the trap 7, but due to gravity particles they will fall down and only pure steam will leave the trap 7. No calcified deposits will be clogging the flow paths 5 and the steam outlets 4 of the steamer, or follow the steam out to deposit on garments and fabrics treated. The lime scale trap 7 is as shown integrated in the flow path 5, thereby providing an efficient solution applicable to small handheld devices.

**[0028]** The foregoing disclosure is not intended to be limited to embodiments herein to the precise forms or particular fields of use as disclosed. It is contemplated that various alternate embodiments and/or modifications to embodiments herein, whether explicitly described or implied herein, are possible in the light of the disclosure.

## Claims

1. A handheld steamer (1) for vertical or horizontal steaming, the steamer (1) comprising;
  - a heated ironing plate (2) providing an ironing surface being adapted to be in contact with a fabric to be treated, wherein the ironing plate (2) is of at least 13.0 cm width and is provided with one or more steam outlets (4),
  - an integrated water tank (3),
  - a boiler (8) for heating water in the water tank

- (3) to produce steam and comprising one or more flow paths (5) for providing the produced steam to said one or more steam outlets (4), a hand grip (6) for a user (13), wherein the ironing plate (2) is heated by that the one or more flow paths (5) are arranged to provide heat to the ironing plate. 5
2. Steamer (1) according to claim 1, wherein the one or more flow paths (5) further comprises one or more lime scale traps (7) . 10
  3. Steamer (1) according to claim 1 or 2, further comprising two flow paths (5) for the steam. 15
  4. Steamer (1) according to any of the preceding claims, further comprising more than two flow paths (5). 20
  5. Steamer (1) according to any of the preceding claims, wherein each of said flow paths (5) comprises one or more lime scale traps (7). 25
  6. Steamer (1) according to any of the preceding claims, wherein the one or more lime scale traps (7) are integrated in the respective one or more flow paths (5). 30
  7. Steamer (1) according to any of the preceding claims, wherein the ironing plate (2) comprises a plurality of steam outlets (4). 35
  8. Steamer (1) according to any of the preceding claims, wherein the ironing plate (2) is provided with a rough surface, providing friction between the ironing plate (7) and the fabric to be treated. 40
  9. Steamer (1) according to any of the preceding claims, wherein the profile of the ironing plate (2) is convex. 45
  10. Steamer (1) according to any of the preceding claims, wherein the steamer (1) further comprises a sheet of heat resistant material arranged between the heated parts and the non-heated parts of the steamer (1), and wherein a part of said sheet is protruding beyond the surface of the ironing plate (2), thereby providing a heat resistant rest position edge (10) when the steamer (1) is placed in a substantially horizontal rest position. 50
  11. Steamer (1) according to any of the preceding claims, wherein the integrated water tank (3) is releasably attached to the steamer (1) by use of one or more magnets (11). 55
  12. Steamer (1) according to any of the preceding claims, further comprising a steam eject button.
  13. Steamer (1) according to any of the preceding claims, wherein the steamer is provided with an auto-shut-off function whereby the steamer is shut off after a predetermined time period.
  14. Steamer (1) according to any of the preceding claims, further comprising one or more sensors connected to the hand grip thereby indicating the presence of a user, and wherein the steamer is automatically shut off after a predetermined time period if no presence of a user is indicated.
  15. Steamer (1) according to any of the preceding claims, further comprising one or more sensors sensing movements of the steamer thereby indicating the presence of a user, wherein the steamer is automatically shut off after a predetermined time period if no presence of a user is indicated.

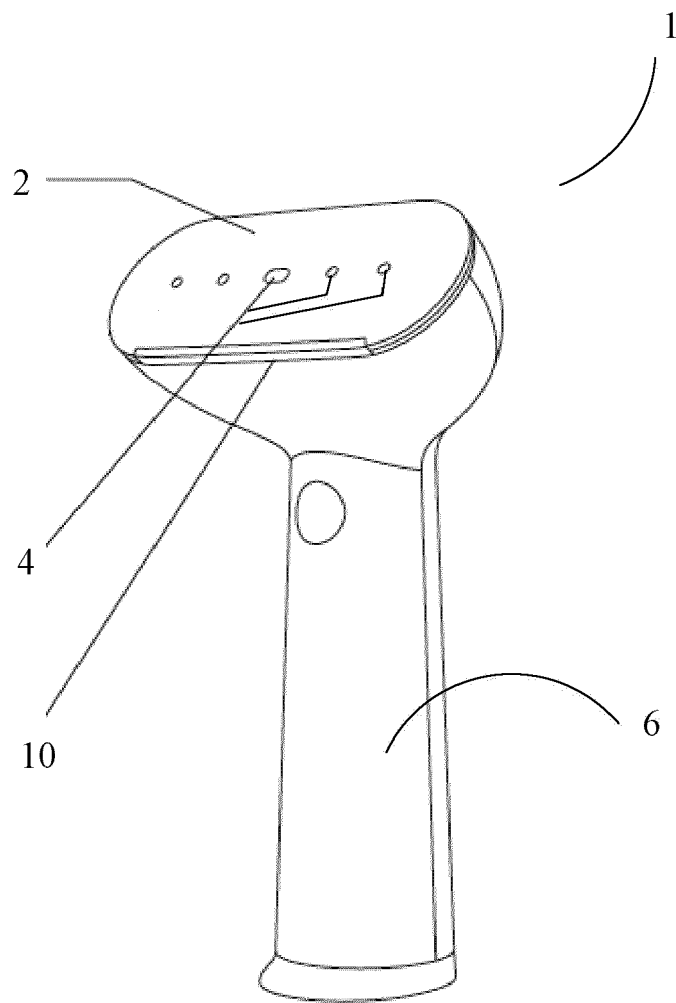


Fig. 1

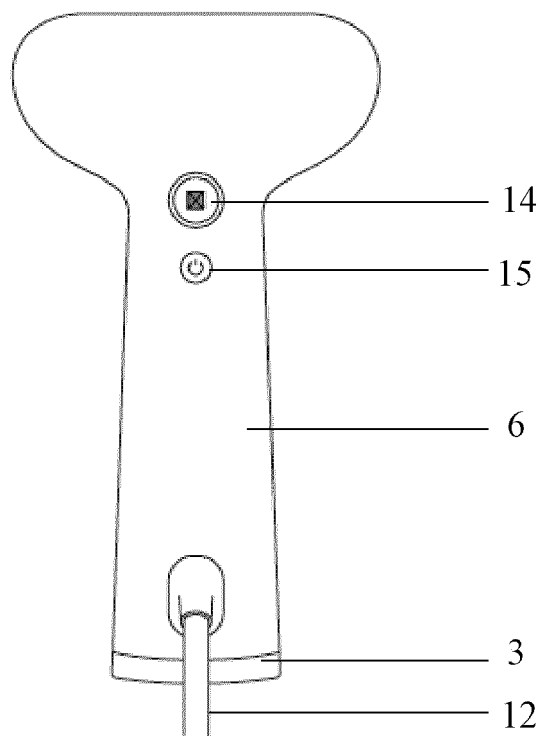
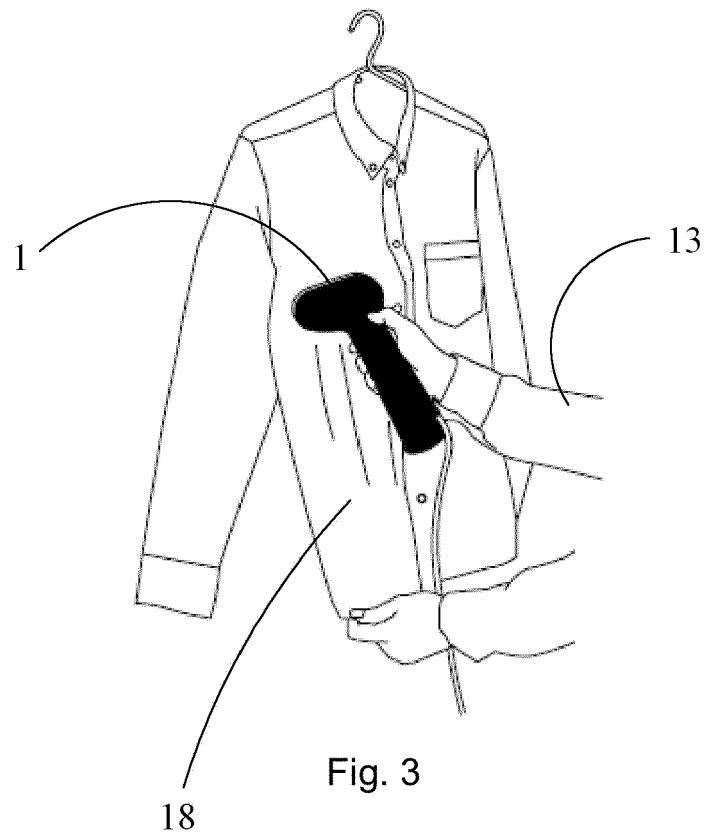


Fig. 2



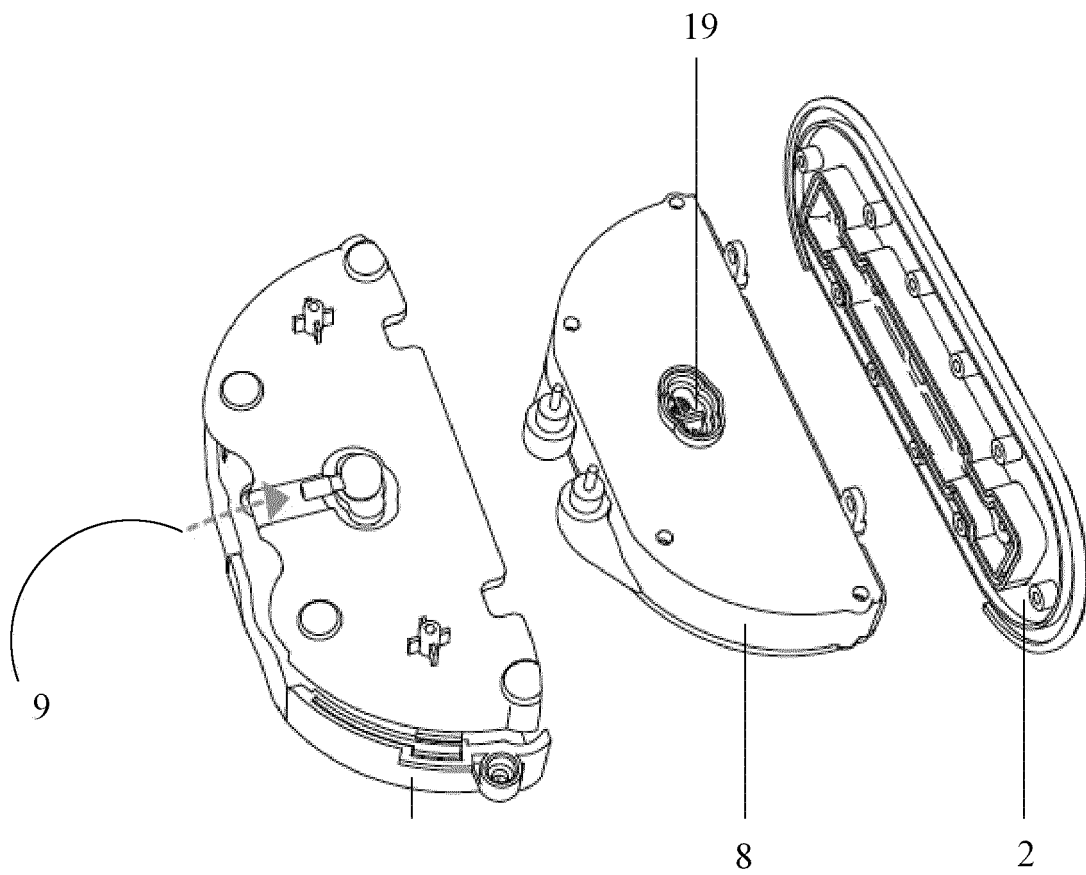


Fig. 4

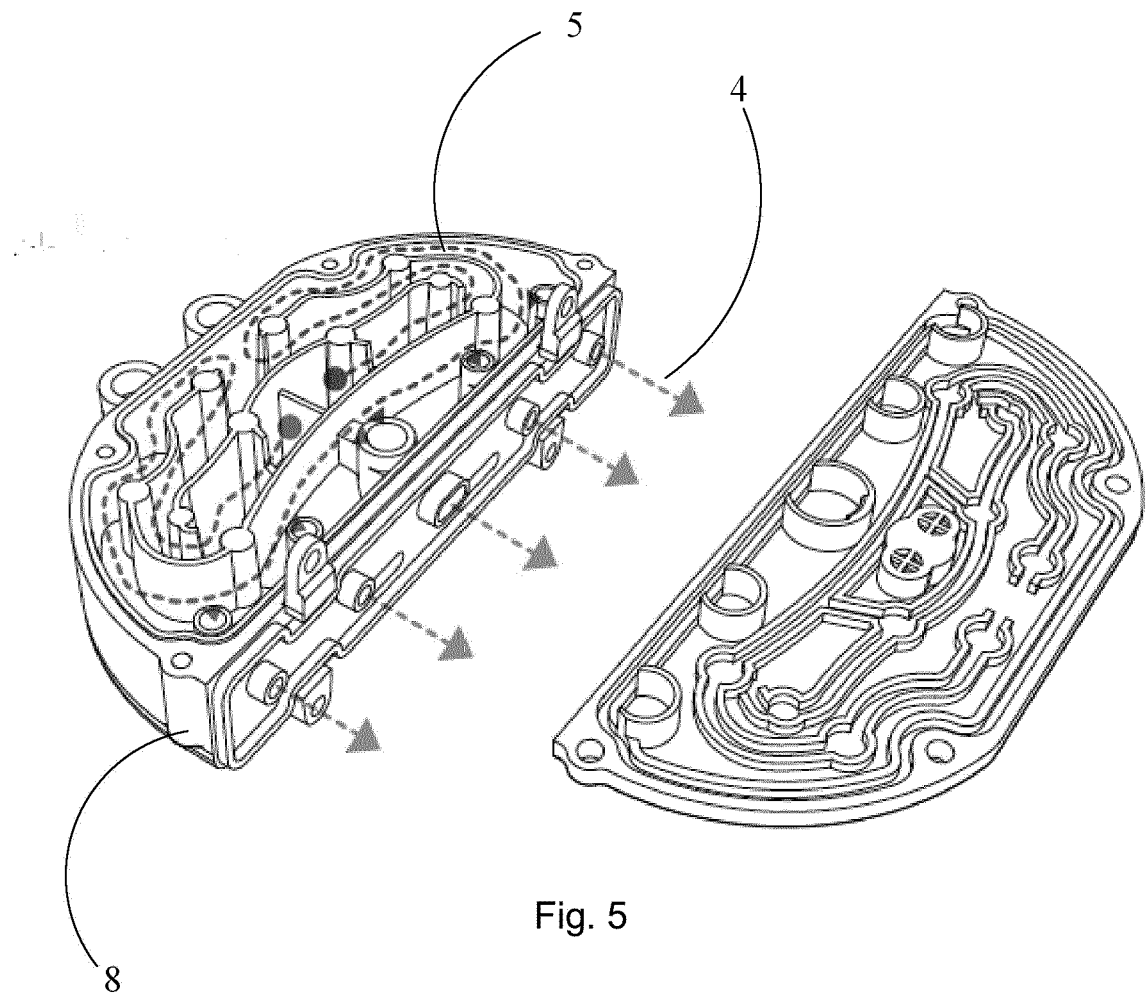


Fig. 5

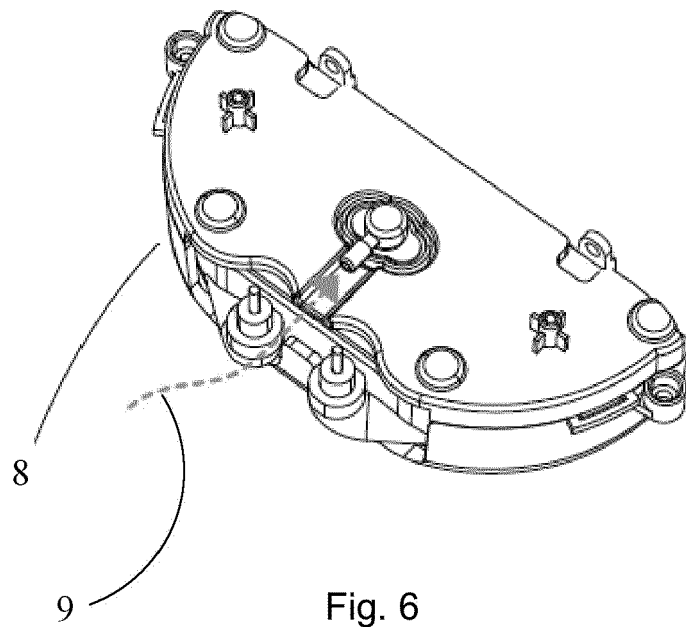


Fig. 6

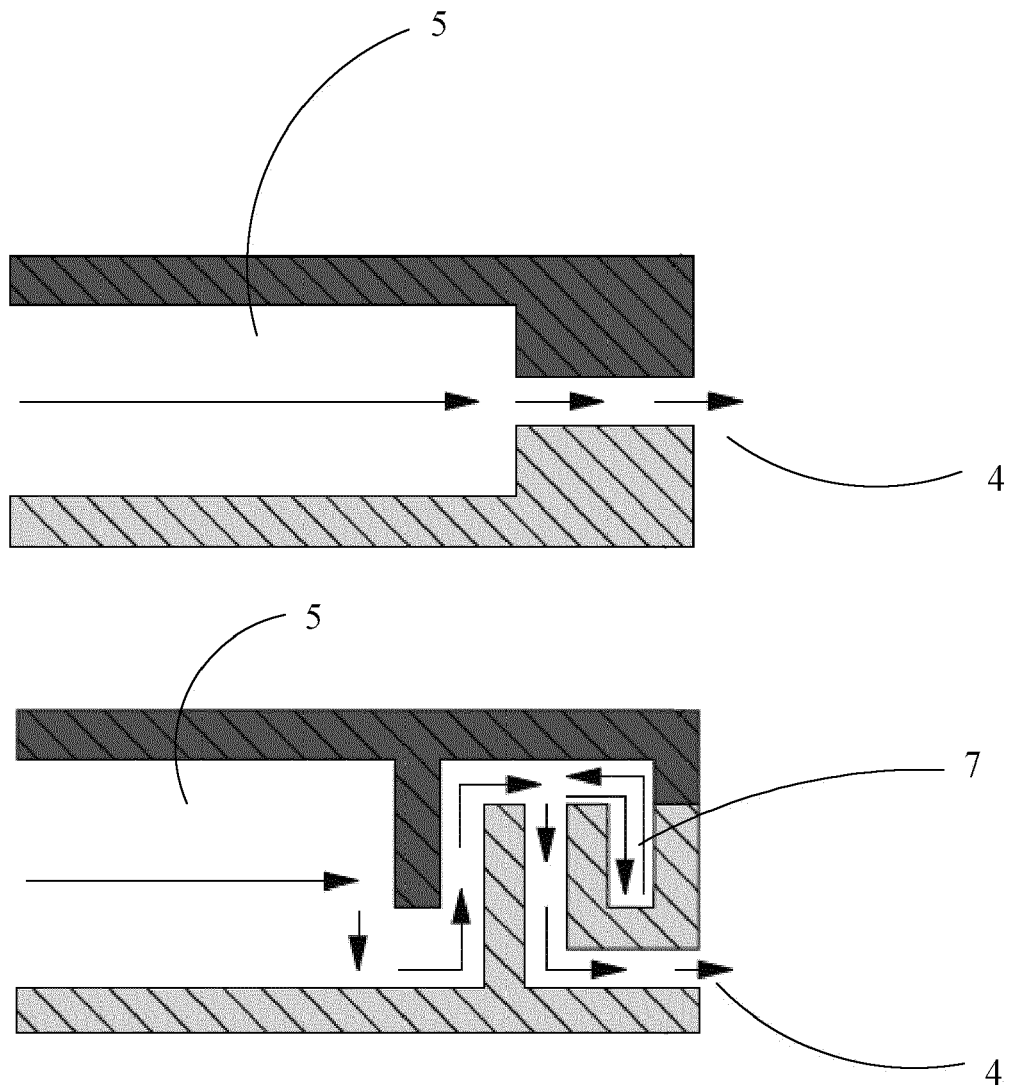


Fig. 7

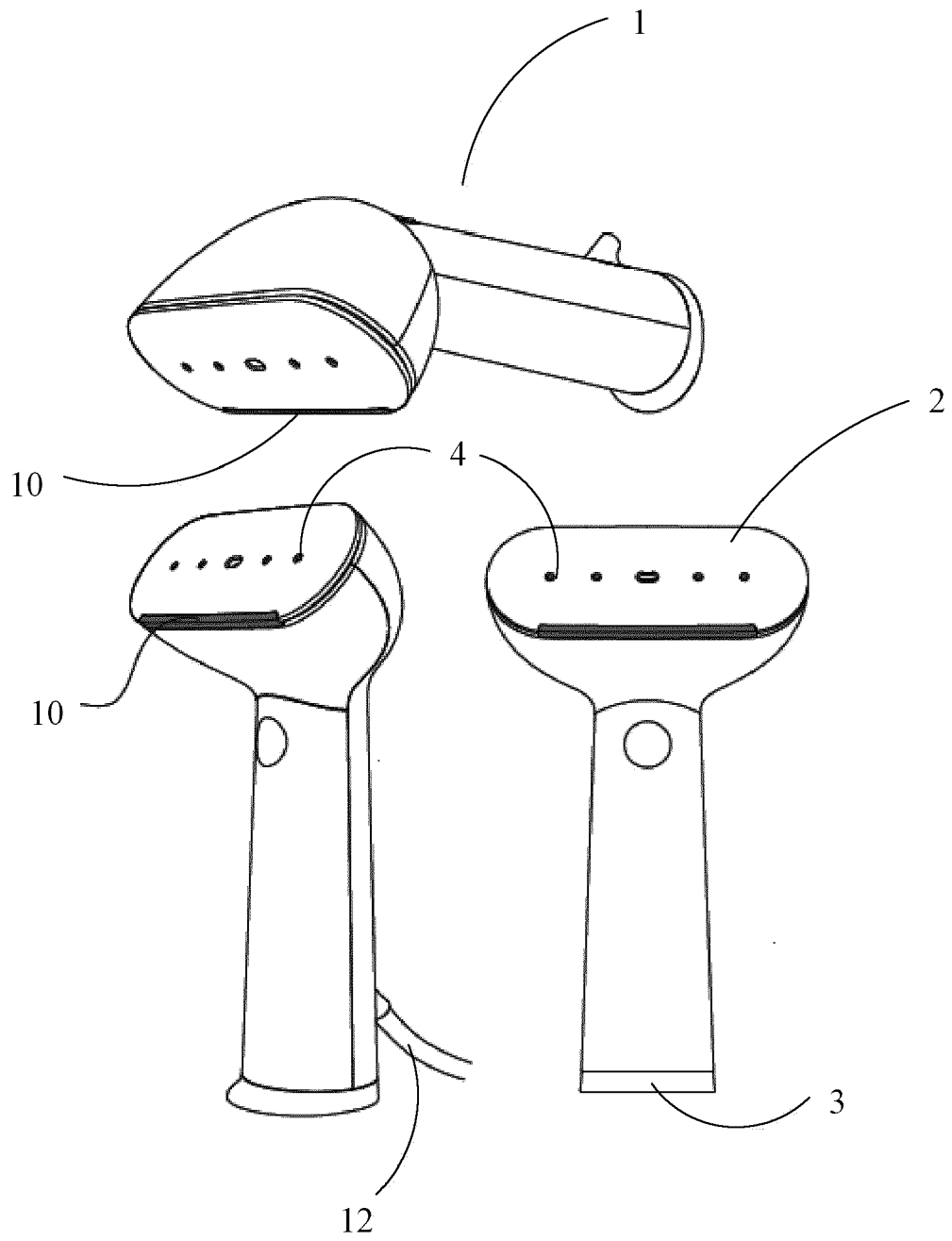


Fig. 3

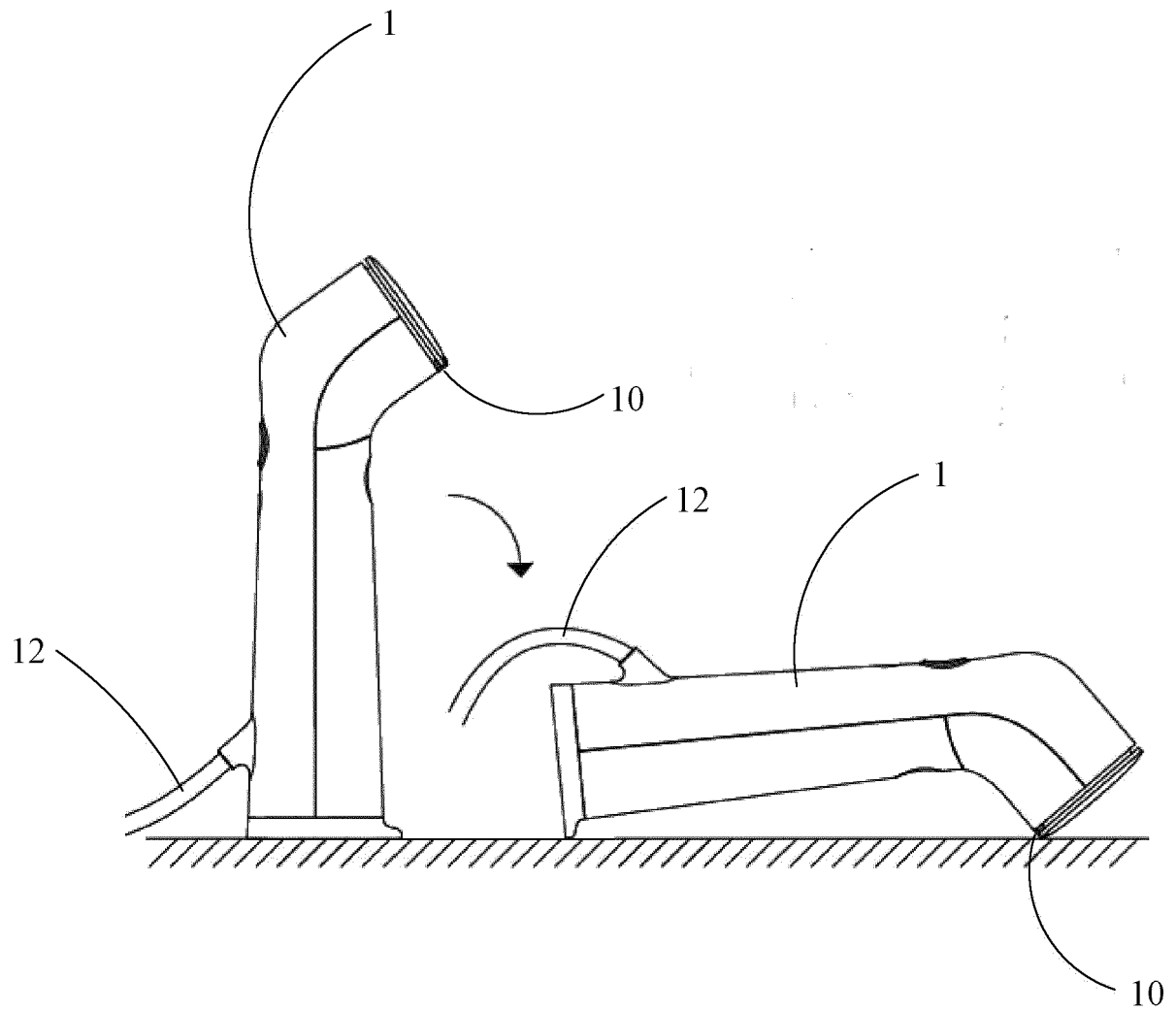


Fig. 9

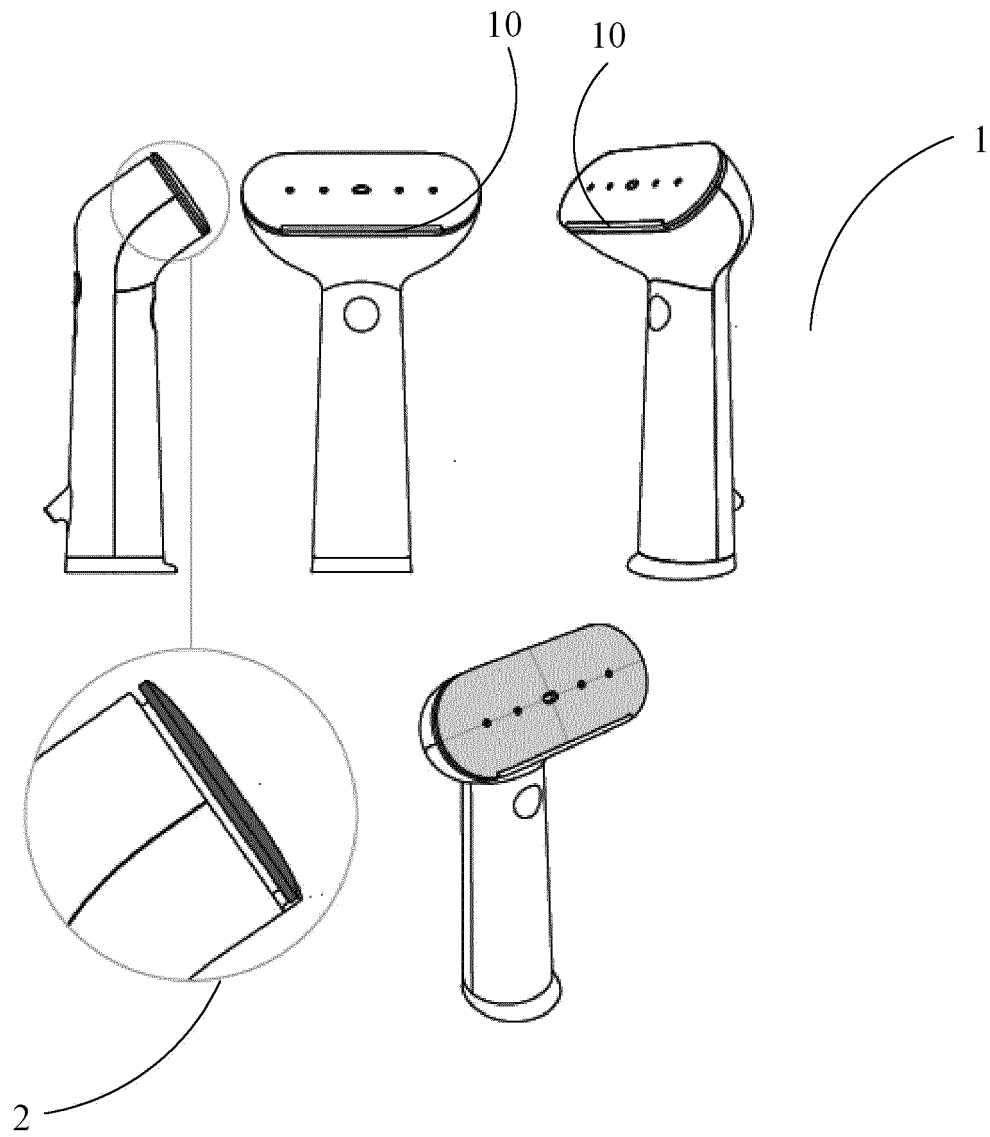
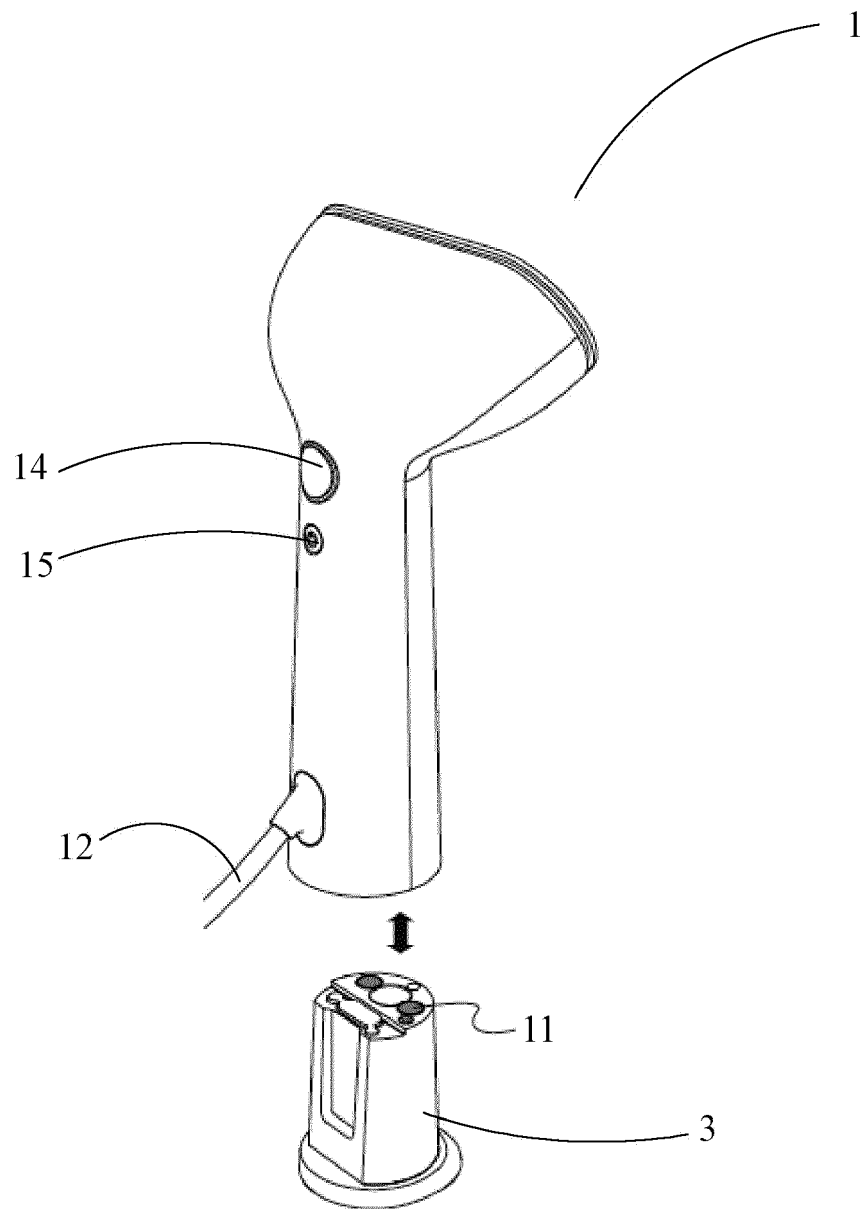
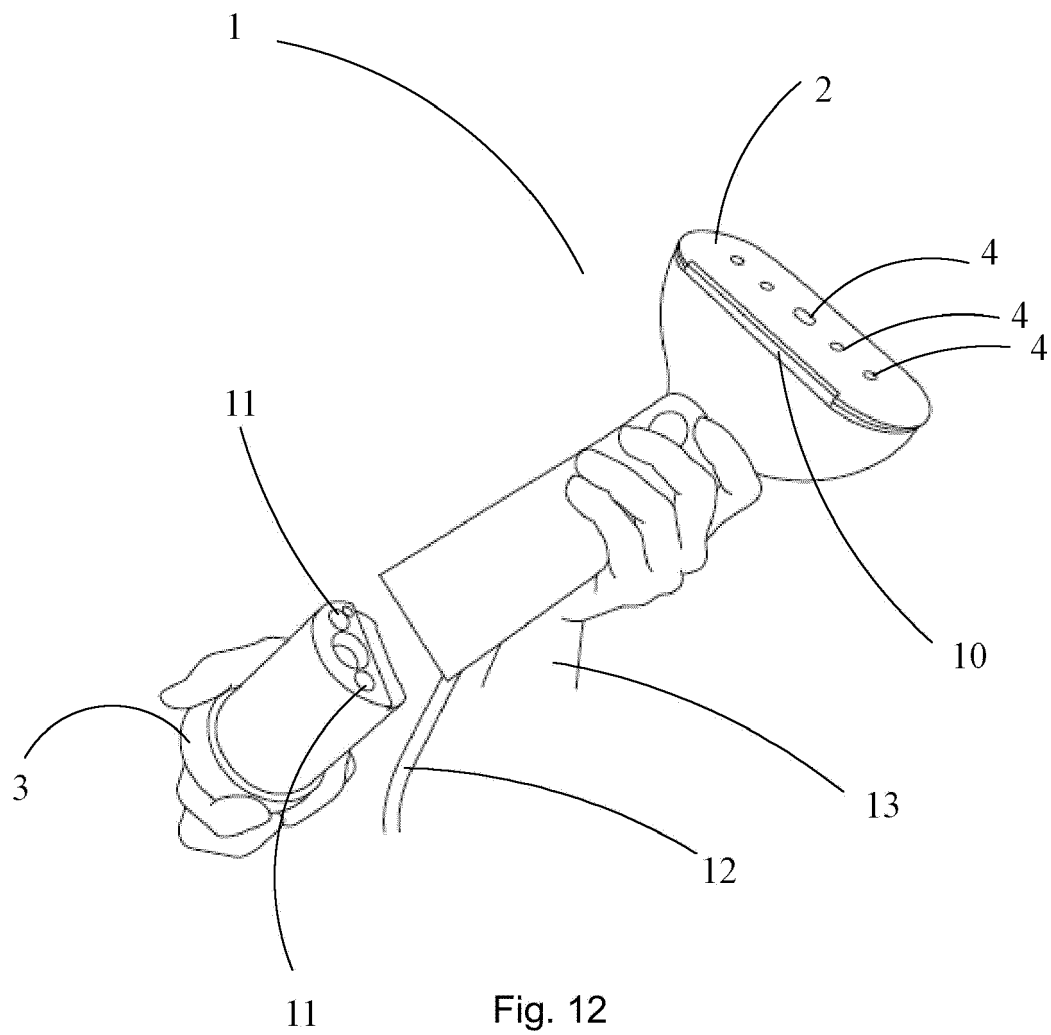


Fig. 10





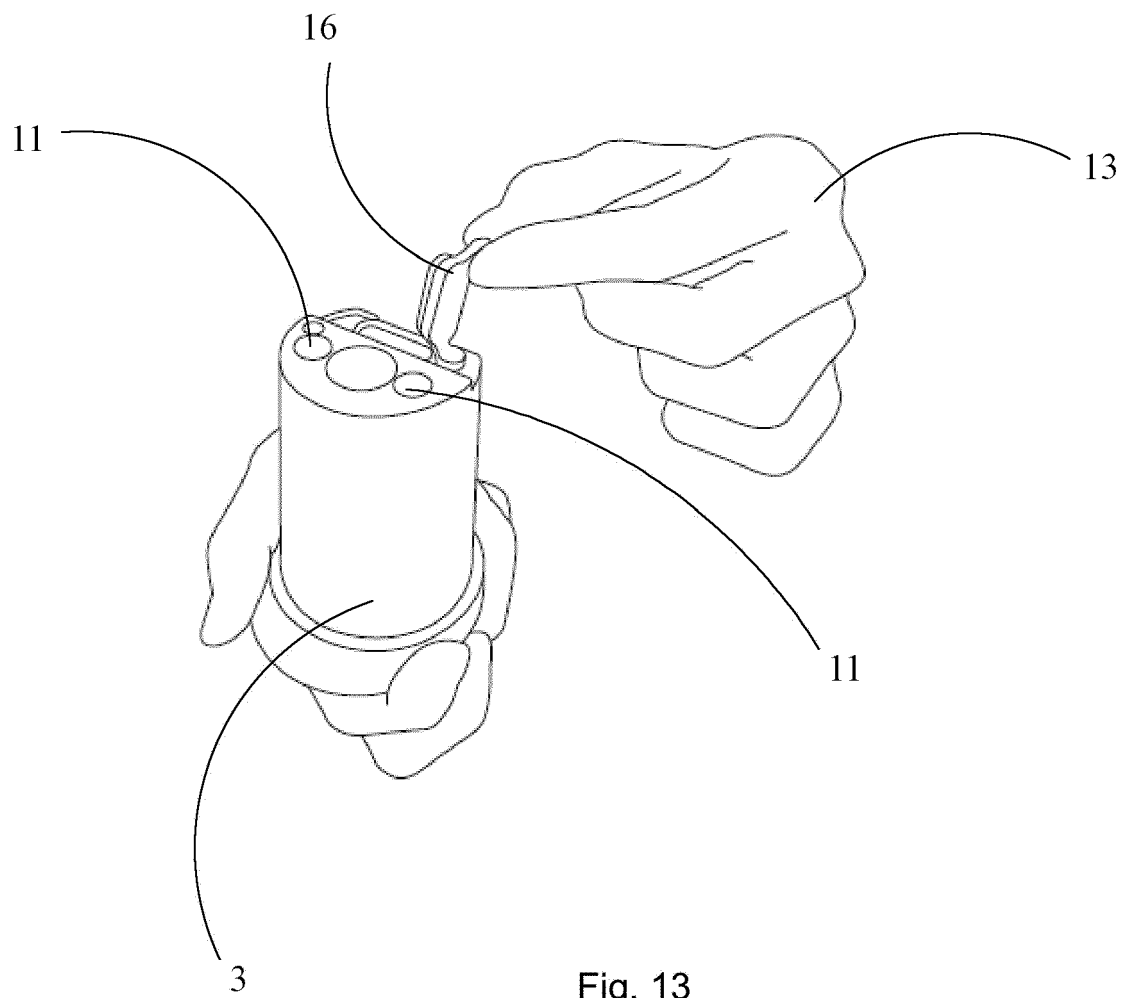


Fig. 13

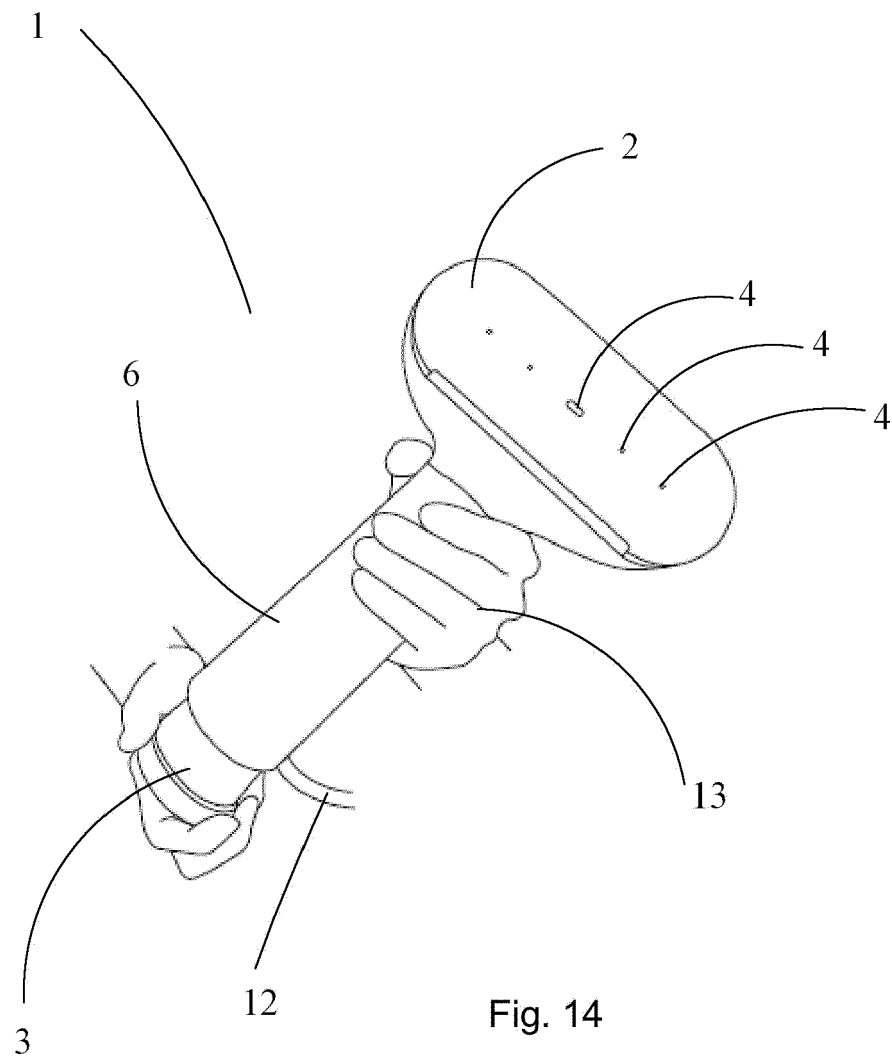


Fig. 14

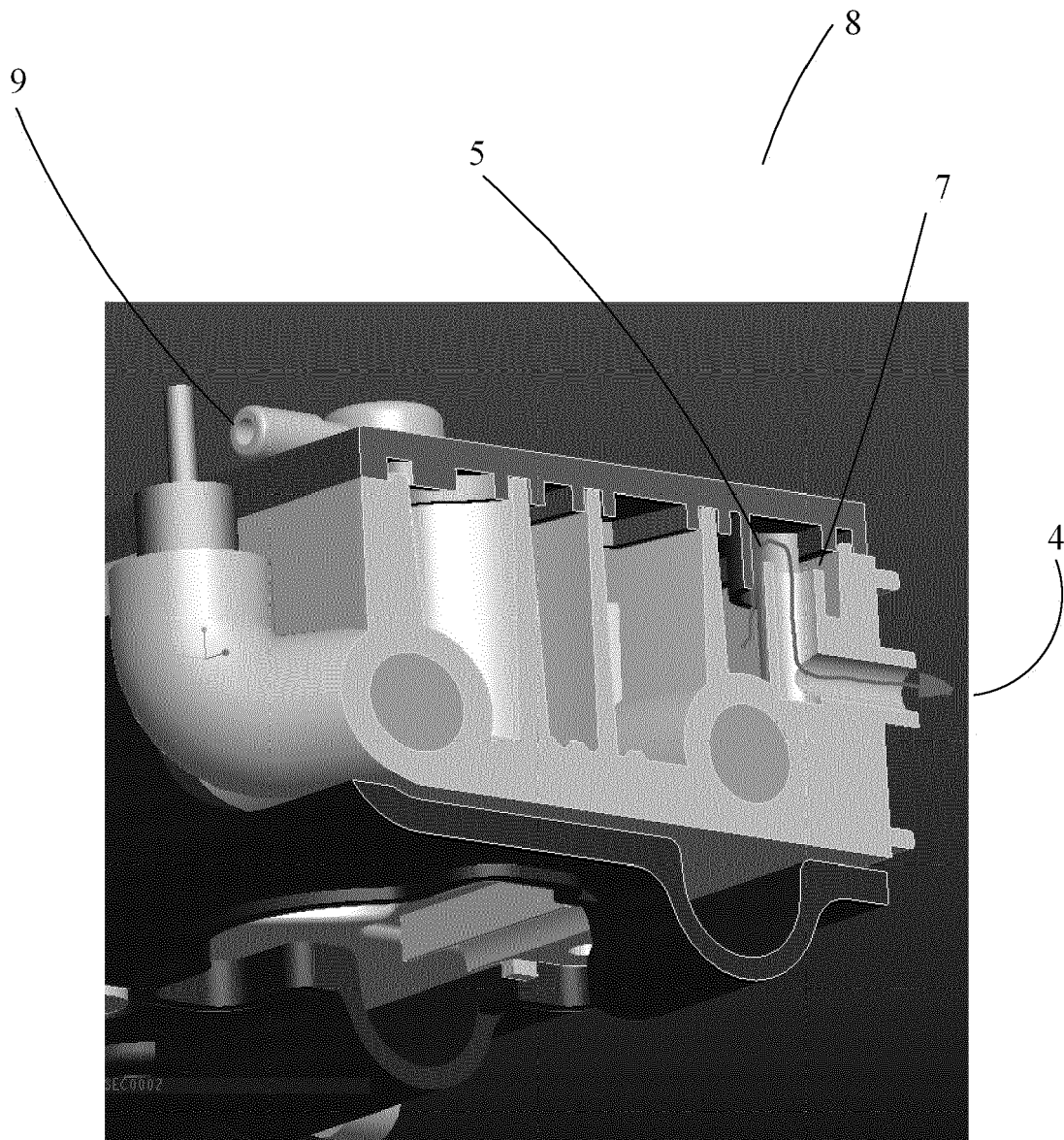


Fig. 15

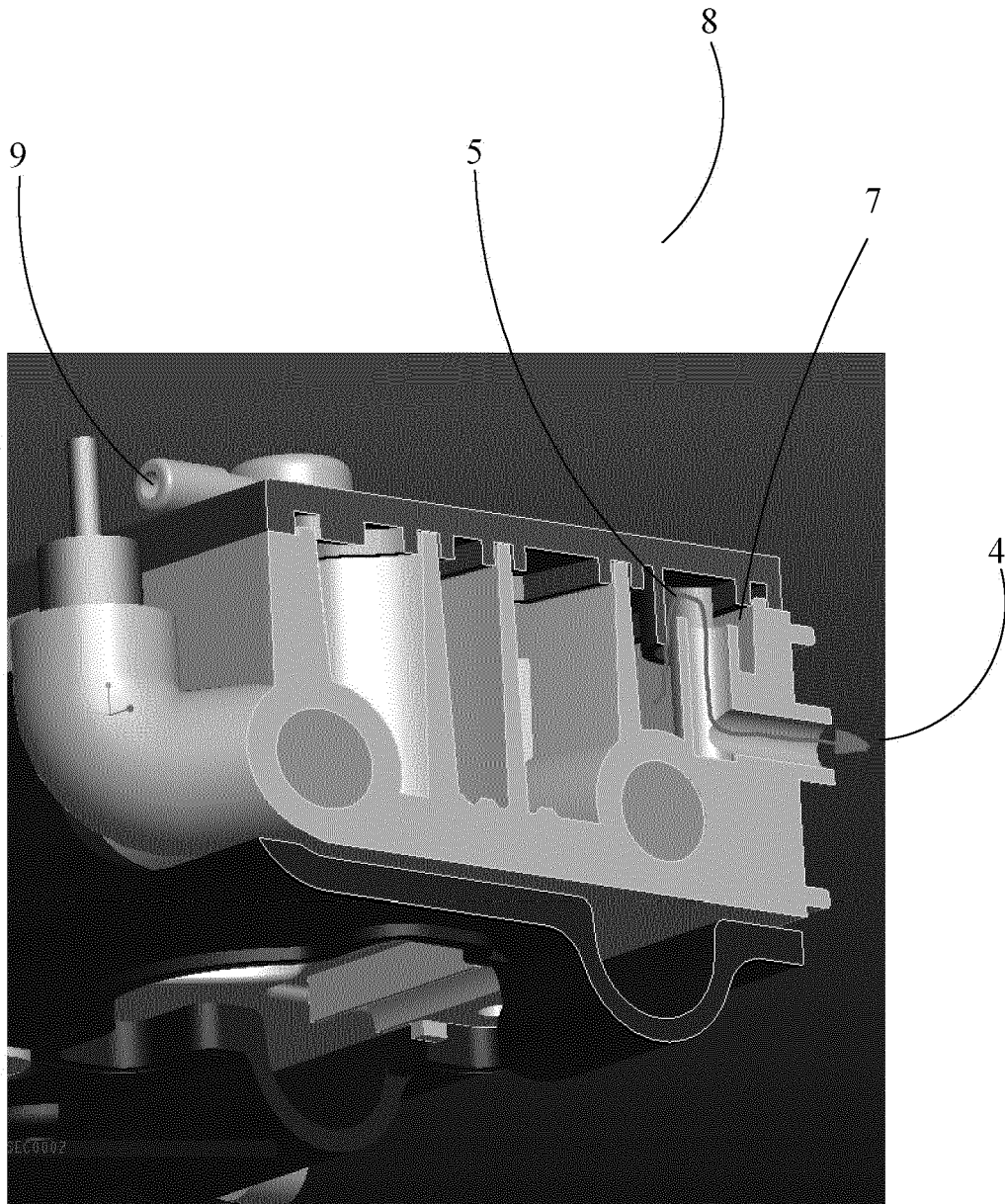


Fig. 15 (in colour)



## EUROPEAN SEARCH REPORT

 Application Number  
 EP 21 17 6053

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| DOCUMENTS CONSIDERED TO BE RELEVANT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                  |                                                      |                                            |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------|------------------------------------------------------|--------------------------------------------|
| Category                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Citation of document with indication, where appropriate, of relevant passages                                                                    | Relevant to claim                                    | CLASSIFICATION OF THE APPLICATION (IPC)    |
| X                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | US 2017/260685 A1 (FUNG KAM FAI [CN])<br>14 September 2017 (2017-09-14)                                                                          | 1-9,12                                               | INV.<br>D06F73/00                          |
| A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | * paragraphs [0005] - [0008] *<br>* paragraphs [0021] - [0029] *<br>* claims 1-11; figures 1-17 *                                                | 10                                                   | ADD.<br>D06F87/00                          |
| A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | EP 2 845 944 A1 (SEB SA [FR])<br>11 March 2015 (2015-03-11)<br>* paragraphs [0005] - [0006] *<br>* paragraphs [0047] - [0049] *<br>* pages 1-7 * | 2,5,6                                                |                                            |
| A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | WO 2017/108440 A1 (KONINKLIJKE PHILIPS NV)<br>29 June 2017 (2017-06-29)<br>* abstract; claim 1; figures 2,3,5,6 *                                | 2,5,6                                                |                                            |
| A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | US 2017/241069 A1 (ECODROP)<br>24 August 2017 (2017-08-24)<br>* paragraphs [0031] - [0043] *<br>* claims 1-6; figures 1-3 *                      | 1-9                                                  |                                            |
| A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | US 2019/186072 A1 (YANG LIN [CN] ET AL)<br>20 June 2019 (2019-06-20)<br>* paragraphs [0021] - [0031] *<br>* figures 1-7 *                        | 1-15                                                 | TECHNICAL FIELDS<br>SEARCHED (IPC)<br>D06F |
| A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | DE 20 2015 104422 U1 (KONINKL PHILIPS NV [NL])<br>2 September 2015 (2015-09-02)<br>* paragraphs [0018] - [0021] *<br>* figures 1-5 *             | 1,10                                                 |                                            |
| A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | US 2017/364049 A1 (YANG ZHIQI [CN] ET AL)<br>21 December 2017 (2017-12-21)<br>* paragraphs [0059] - [0061]; claims 1-7;<br>figures 1-5 *         | 1,13-15                                              |                                            |
| The present search report has been drawn up for all claims                                                                                                                                                                                                                                                                                                                                                                                                                                                                             |                                                                                                                                                  |                                                      |                                            |
| Place of search<br>Munich                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                              |                                                                                                                                                  | Date of completion of the search<br>10 November 2021 | Examiner<br>Weinberg, Ekkehard             |
| CATEGORY OF CITED DOCUMENTS<br>X : particularly relevant if taken alone<br>Y : particularly relevant if combined with another document of the same category<br>A : technological background<br>O : non-written disclosure<br>P : intermediate document<br>T : theory or principle underlying the invention<br>E : earlier patent document, but published on, or after the filing date<br>D : document cited in the application<br>L : document cited for other reasons<br>& : member of the same patent family, corresponding document |                                                                                                                                                  |                                                      |                                            |



## EUROPEAN SEARCH REPORT

Application Number  
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| DOCUMENTS CONSIDERED TO BE RELEVANT                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |                                                                                                                                                    |                                                             |                                         |
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| Category                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                               | Citation of document with indication, where appropriate, of relevant passages                                                                      | Relevant to claim                                           | CLASSIFICATION OF THE APPLICATION (IPC) |
| A                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                      | US 4 745 260 A (ALBINGER JR HARRY [US] ET AL) 17 May 1988 (1988-05-17)<br>* column 1, lines 41-56 *<br>* claim 1; figure 1 *                       | 13,15                                                       |                                         |
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